

## **Research project:**

# **The spatial thinking ability of individuals employed in the Geospatial information industry**

## **An invite for participation**

Research in progress:

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**Define tomorrow.**

UNISA



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of south africa

# What is spatial thinking?

- Three components of spatial thinking:
  - Processes of reasoning
  - Concept of space
  - Representation tools
- Example
  - Cognitive level at which you can solve problems
  - Non-spatial, Spatial primitives, Simple Spatial, Complex Spatial
  - Maps, diagrams, charts, GIS, remote sensing software etc.

Any person at any age can learn to think spatially



# Importance of spatial thinking in natural disasters

- Textbook questions about disasters in Indonesia and the use of GIS in Indonesian textbooks.
- Results – questions asked will not sufficiently develop the spatial thinking skills of learners
- Recommendation - the questions posed in Geography textbooks should be redesigned to better support the development of the spatial thinking skills of school learners living in disaster-prone areas.
- Expanding on the learners' spatial thinking skills will improve their decision-making skills, which would prove crucial should a natural disaster occur in their area.
- Being able to think spatially is an essential survival skill for learners living in disaster-prone regions in Indonesia

# Measurement of Spatial thinking abilities

- Spatial Thinking Ability Test (STAT) (Lee and Bednarz, 2012)

Question number	Spatial thinking categories
1 and 2	Comprehending direction and orientation
3	Comparison of the map and graphic information
4	Selecting the best location when given several spatial factors
5	Visualisation of a slope profile from a topographic map
6 and 7	Connecting spatially distributed phenomena
8	Visualisation of 3-D images from 2-D images
9, 10,11 and 12	Overlaying and dissolving map layers
13,14, 15 and 16	Comprehending geographic features represented as points, lines or polygons

## Related studies in a nutshell

- Used to gauge the spatial thinking abilities of school learners and students:
  - Geocaching exercise
  - The influence of Geography modules on the development of the spatial thinking abilities of students.
  - Differences in the spatial thinking abilities of undergraduate students

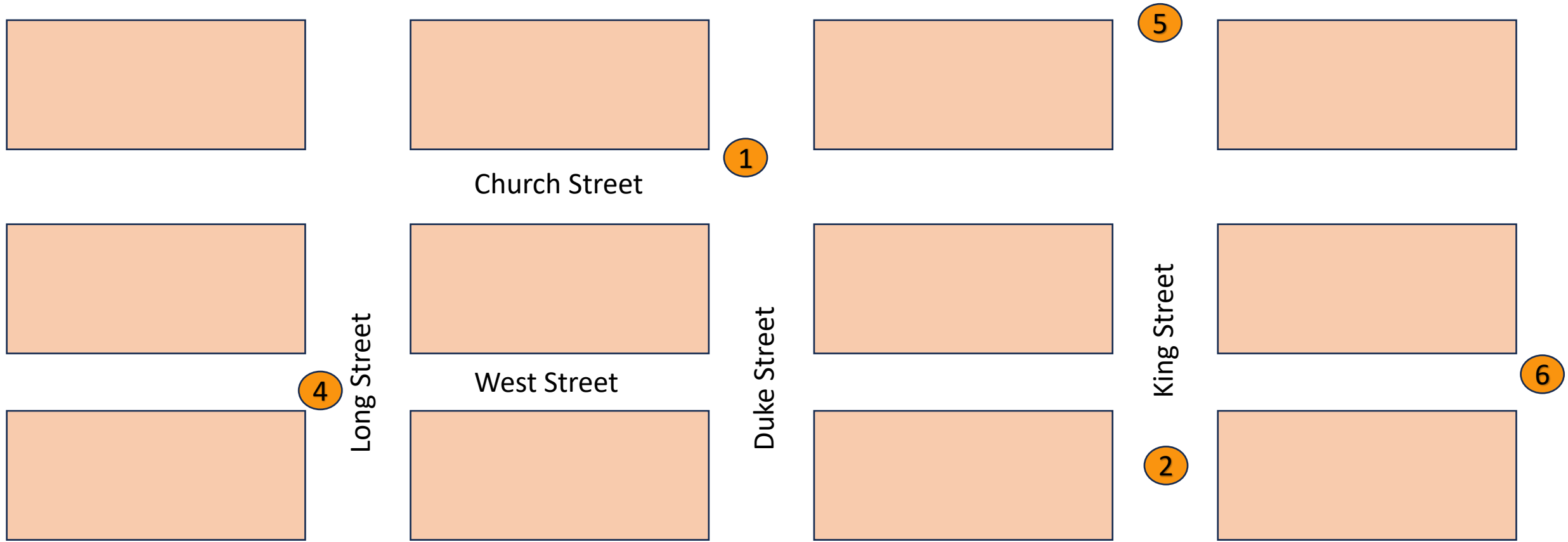
Most studies were done in the USA.

One focus on Ethiopian students

No focus on individuals employed in the Geospatial industry

# Example of question: Comprehending direction and orientation (Note – not the real question!)

Answer the question based on the street map below:

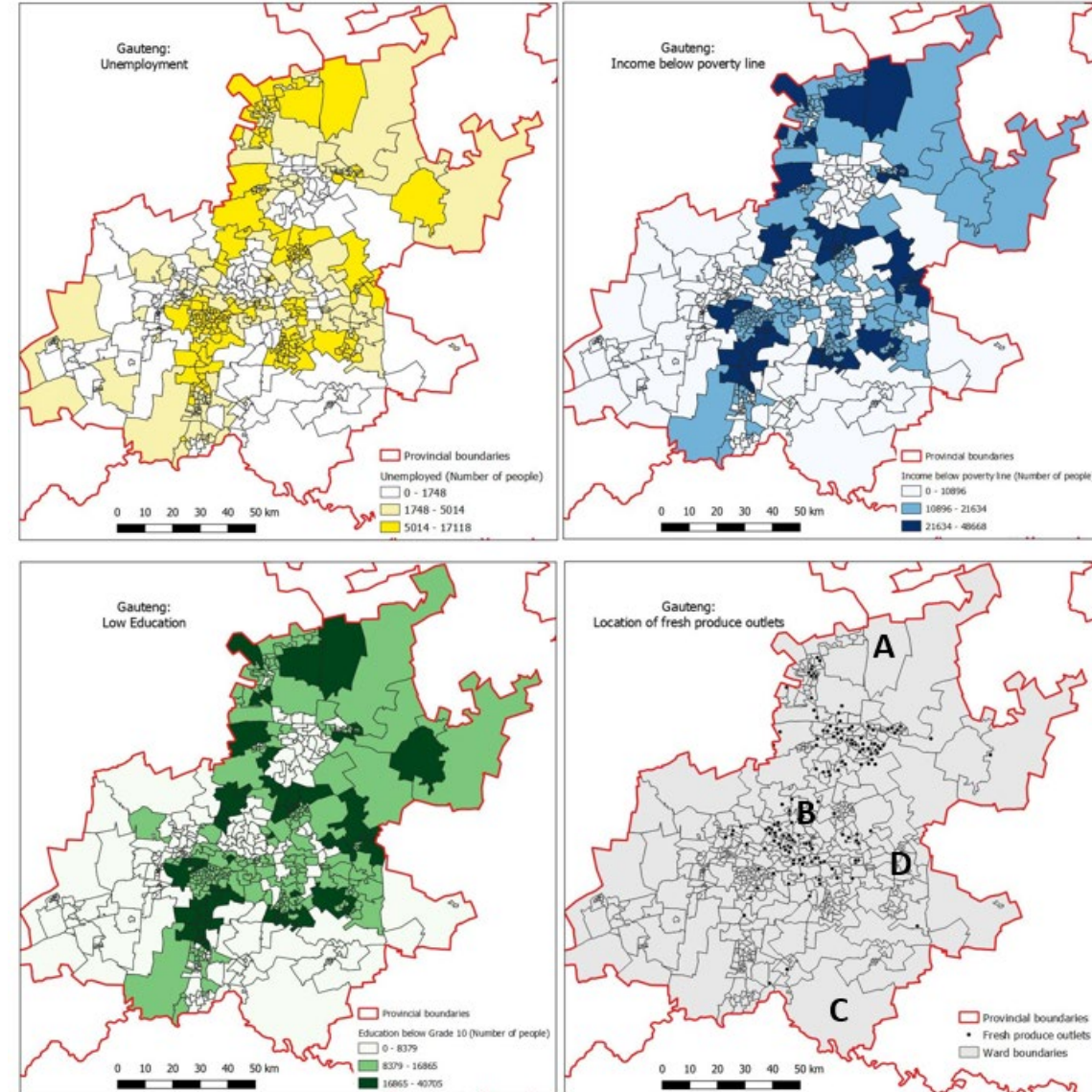


Point 1: Walk east for two blocks, then walk south for one block. Walk west for three blocks.  
Which number is the closest to you?



# Example of question: Overlaying and dissolving map layers (Note – not the real question!)

- Predict which communities in the Greater Tshwane area are potentially at risk of food insecurity.
- Communities at risk of food insecurity are communities that:
  - have a low income.
  - have a high unemployment rate.
  - Have a low level of education.



# Why is it important to know the spatial thinking abilities of the Geo-information society?

This research aims to gauge the spatial thinking abilities of geospatial information scientists employed in the geospatial information industry in South Africa.

1. Determine the spatial thinking abilities of geospatial information scientists using the STAT.
2. Determine if there is a relationship between the spatial thinking abilities of the geospatial information scientists and their background, experiences, qualifications, knowledge, and skills.

- Recommendations can be made for further continuous professional development to address the gaps (if any)
  - Whether experience improves the spatial thinking abilities of individuals
  - Recommendations can be made on suitable qualifications, experience, etc., for specific kinds of jobs.
- 
- Ethics approval was obtained.
  - Permission was obtained from GISSA and SSAG to distribute the STAT to registered members



# Spatial thinking ability of geospatial information scientists

<https://forms.office.com/r/fnzErZA9zn>



We are excited to extend an invitation to you to participate in this research project .

Your contribution will be invaluable in advancing our understanding of the spatial thinking abilities of the Geospatial community of South Africa.

**THANK YOU**



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